

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A printing device having a sensitizing drum and a developing roller, comprising:

a judgment unit for judging whether a service life of a loaded developing agent cartridge has expired by accessing a memory unit built into said developing agent cartridge, said memory unit storing information concerning the service life of the developing agent cartridge; and

an operation mode setting unit for setting an operation mode to a safety mode in order to prevent printing troubles when said judgment unit determines that the service life of said developing agent cartridge has expired;

wherein said safety mode is to execute a printing process with an increased cleaning frequency, an increased calibration frequency or an increased communication frequency with a control center compared to those of a standard mode,

the printing device prints by an electronic photograph method and collects toner remaining on the sensitizing drum by using the developing roller while rotating the sensitizing drum as a sequence independent of a printing sequence to clean the sensitizing drum, and

when the printing device increases cleaning frequency in the safety mode compared to the standard mode, the printing device executes a cleaning process per printing job in the standard mode and executes a cleaning process per printing page in the safety mode.

2. (Previously presented) A printing device described in claim 1, further comprising:

a consumption information reading unit for reading consumption information that represents a consumption rate of said developing agent cartridge at a printed time stored in a memory unit of said developing agent cartridge, wherein

said judgment unit determines whether the service life of said developing agent cartridge has expired by comparing the consumption information of said developing agent cartridge read by said

consumption information reading unit with preset service life information that represents the service life of said developing agent cartridge.

3. (Original) A printing device described in claim 1 wherein said consumption information and service life information are based on a number of printed sheets, a number of effective pixels used in forming images, or an amount of consumed developing agent.

4. (Canceled)

5. (Original) A printing device described in claim 1 wherein said developing agent cartridge is either a toner cartridge or an ink cartridge.

6. (Currently Amended) A printing device having a sensitizing drum and a developing roller, comprising:

a judgment unit for judging whether a service life of a loaded developing agent cartridge has expired by accessing a memory unit built into said developing agent cartridge, said memory unit storing information concerning the service life of the developing agent cartridge; and

an operation mode setting unit for setting an operation mode to a safety mode in which a printing process is executed with an increased cleaning frequency compared to that of a standard mode when said judgment unit determines that the service life of said developing agent cartridge has expired, wherein

the printing device prints by an electronic photograph method and collects toner remaining on the sensitizing drum by using the developing roller while rotating the sensitizing drum as a sequence independent of a printing sequence to clean the sensitizing drum, and

when the printing device increases cleaning frequency in the safety mode compared to the standard mode, the printing device executes a cleaning process per printing job in the standard mode and executes a cleaning process per printing page in the safety mode.

7. (Original) A printing device described in claim 6 wherein

said cleaning frequency is such that cleaning is executed in every page of image formation.

8. (Currently Amended) A printing method for printing with a printing device having a sensitizing drum and a developing roller, comprising:

a judgment step of judging whether a service life of a loaded developing agent cartridge has expired by accessing a memory unit built into said developing agent cartridge, said memory unit storing information concerning the service life of the developing agent cartridge; and

an operation mode setting step of setting an operation mode to a safety mode in order to prevent printing troubles when said judgment step determines that the service life of said developing agent cartridge has expired;

wherein said safety mode is to execute a printing process with an increased cleaning frequency, an increased calibration frequency or an increased communication frequency with a control center compared to those of a standard mode,

the printing device prints by an electronic photograph method and collects toner remaining on the sensitizing drum by using the developing roller while rotating the sensitizing drum as a sequence independent of a printing sequence to clean the sensitizing drum, and

when the printing device increases cleaning frequency in the safety mode compared to the standard mode, the printing device executes a cleaning process per printing job in the standard mode and executes a cleaning process per printing page in the safety mode.

9. (Previously presented) A printing method described in claim 8, further comprising:

a consumption information reading step of reading consumption information that represents consumption rate of said developing agent cartridge at a printed time stored in a memory unit of said developing agent cartridge, wherein

said judgment step determines whether the service life of said developing agent cartridge has expired by comparing the consumption information of said developing agent cartridge read by said

consumption information reading step with preset service life information that represents the service life of said developing agent cartridge.

10. (Original) A printing method described in claim 8 wherein said consumption information and service life information are based on a number of printed sheets, a number of effective pixels used in forming images, or an amount of consumed developing agent.

11. (Canceled)

12. (Original) A printing method described in claims 8 wherein said developing agent cartridge is either a toner cartridge or an ink cartridge.

13. (Currently Amended) A printing method for printing with a printing device having a sensitizing drum and a developing roller, comprising:

a judgment step of judging whether a service life of a loaded developing agent cartridge has expired by accessing a memory unit built into said developing agent cartridge, said memory unit storing information concerning the service life of the developing agent cartridge; and

an operation mode setting step of setting an operation mode to a safety mode in which a printing process is executed with an increased cleaning frequency compared to that of a standard mode when said judgment step determines that the service life of said developing agent cartridge has expired, wherein

the printing device prints by an electronic photograph method and collects toner remaining on the sensitizing drum by using the developing roller while rotating the sensitizing drum as a sequence independent of a printing sequence to clean the sensitizing drum, and

when the printing device increases cleaning frequency in the safety mode compared to the standard mode, the printing device executes a cleaning process per printing job in the standard mode and executes a cleaning process per printing page in the safety mode.

14. (Canceled)

15. (Currently Amended) A printing program for causing a printing device having a sensitizing drum and a developing roller to execute:

a judgment step of judging whether a service life of a loaded developing agent cartridge has expired by accessing a memory unit built into said developing agent cartridge, said memory unit storing information concerning the service life of the developing agent cartridge; and

an operation mode setting step of setting an operation mode to a safety mode in order to prevent printing troubles when said judgment step determines that the service life of said developing agent cartridge has expired, wherein

the printing device prints by an electronic photograph method and collects toner remaining on the sensitizing drum by using the developing roller while rotating the sensitizing drum as a sequence independent of a printing sequence to clean the sensitizing drum, and

when the printing device increases cleaning frequency in the safety mode compared to the standard mode, the printing device executes a cleaning process per printing job in the standard mode and executes a cleaning process per printing page in the safety mode.

16. (Previously presented) A printing program described in claim 15, further causing a printing device to execute:

a consumption information reading step of reading consumption information that represents a consumption rate of said developing agent cartridge at a printed time stored in a memory unit of said developing agent cartridge, wherein

said judgment step determines whether the service life of said developing agent cartridge has expired by comparing the consumption information of said developing agent cartridge read by said consumption information reading step with preset service life information that represents the service life of said developing agent cartridge.

17. (Original) A printing program described in claim 15 wherein

said consumption information and service life information are based on a number of printed sheets, a number of effective pixels used in forming images, or an amount of consumed developing agent.

18. (Original) A printing program described in claim 15 wherein said safety mode is to execute a printing process with an increased cleaning frequency, an increased calibration frequency or an increased communication frequency with a control center, or a reduced printing speed compared to those of a standard mode.

19. (Original) A printing program described in claim 15 wherein said developing agent cartridge is either a toner cartridge or an ink cartridge.

20. (Original) A computer-readable recording medium on which the printing program described in claim 15 is recorded.

21. (Currently amended) A printing device having a sensitizing drum and a developing roller, comprising:

a judgment unit for judging whether a loaded developing agent cartridge is an authorized product; and

an operation mode setting unit for setting an operation mode to a safety mode in order to prevent printing troubles when said judgment unit determines that said developing agent cartridge is not an authorized product;

wherein said safety mode is to execute a printing process with an increased cleaning frequency, an increased calibration frequency or an increased communication frequency with a control center compared to those of a standard mode,

the printing device prints by an electronic photograph method and collects toner remaining on the sensitizing drum by using the developing roller while rotating the sensitizing drum as a sequence independent of a printing sequence to clean the sensitizing drum, and

when the printing device increases cleaning frequency in the safety mode compared to the standard mode, the printing device executes a cleaning process per printing job in the standard mode and executes a cleaning process per printing page in the safety mode.

22. (Previously Presented) A printing device described in claim 21 further comprising:
a product information reading unit for reading product information for identifying a product of said printing device or said developing agent cartridge stored in a memory unit of said developing agent cartridge, wherein

said judgment unit determines whether said developing agent cartridge is an authorized product or not by comparing the product information read by said product information reading unit with a product information of an authorized product.

23. (Canceled)

24. (Original) A printing device described in claim 21 wherein
said developing agent cartridge is either a toner cartridge or an ink cartridge.

25. (Currently Amended) A printing device having a sensitizing drum and a developing roller, comprising:

a judgment unit for judging whether a loaded developing agent cartridge is an authorized product; and

an operation mode setting unit for setting an operation mode to a safety mode in which a printing process is executed with an increased cleaning frequency compared to that of a standard mode when said judgment unit determines that said developing agent cartridge is not an authorized product, wherein

the printing device prints by an electronic photograph method and collects toner remaining on the sensitizing drum by using the developing roller while rotating the sensitizing drum as a sequence independent of a printing sequence to clean the sensitizing drum, and

when the printing device increases cleaning frequency in the safety mode compared to the standard mode, the printing device executes a cleaning process per printing job in the standard mode and executes a cleaning process per printing page in the safety mode.

26. (Original) A printing device described in claim 25 wherein

said cleaning frequency is such that cleaning is executed in every page of image formation.

27. (Currently Amended) A printing method for printing with a printing device having a sensitizing drum and a developing roller, comprising:

a judgment step of judging whether a loaded developing agent cartridge is an authorized product; and

an operation mode setting step of setting an operation mode to a safety mode in order to prevent printing troubles when said judgment step determines that said developing agent cartridge is not an authorized product;

wherein said safety mode is to execute a printing process with an increased cleaning frequency, an increased calibration frequency or an increased communication frequency with a control center compared to those of a standard mode,

the printing device prints by an electronic photograph method and collects toner remaining on the sensitizing drum by using the developing roller while rotating the sensitizing drum as a sequence independent of a printing sequence to clean the sensitizing drum, and

when the printing device increases cleaning frequency in the safety mode compared to the standard mode, the printing device executes a cleaning process per printing job in the standard mode and executes a cleaning process per printing page in the safety mode.

28. (Previously Presented) A printing method described in claim 27 further comprising:

a product information reading step of reading product information for identifying a product of said printing device or said developing agent cartridge stored in a memory unit of said developing agent cartridge, wherein

said judgment step determines whether said developing agent cartridge is an authorized product or not by comparing the product information read by said product information reading step with a product information of an authorized product.

29. (Canceled)

30. (Original) A printing method described in claim 27 wherein said developing agent cartridge is either a toner cartridge or an ink cartridge.

31. (Currently Amended) A printing method for printing with a printing device having a sensitizing drum and a developing roller, comprising:

a judgment step of judging whether a loaded developing agent cartridge is an authorized product; and

an operation mode setting step of setting an operation mode to a safety mode in which a printing process is executed with an increased cleaning frequency compared to that of a standard mode when said judgment step determines that said developing agent cartridge is not an authorized product, wherein

the printing device prints by an electronic photograph method and collects toner remaining on the sensitizing drum by using the developing roller while rotating the sensitizing drum as a sequence independent of a printing sequence to clean the sensitizing drum, and

when the printing device increases cleaning frequency in the safety mode compared to the standard mode, the printing device executes a cleaning process per printing job in the standard mode and executes a cleaning process per printing page in the safety mode.

32. (Original) A printing method described in claim 31 wherein

said cleaning frequency is such that cleaning is executed in every page of image formation.

33. (Currently Amended) A computer-readable medium storing a printing program for causing a printing device having a sensitizing drum and a developing roller to execute:

a judgment step of judging whether a loaded developing agent cartridge is an authorized product; and

an operation mode setting step of setting an operation mode to a safety mode in order to prevent printing troubles when said judgment step determines that said developing agent cartridge is not an authorized product,

wherein said safety mode is to execute a printing process with an increased cleaning frequency, an increased calibration frequency or an increased communication frequency with a control center compared to those of a standard mode,

the printing device prints by an electronic photograph method and collects toner remaining on the sensitizing drum by using the developing roller while rotating the sensitizing drum as a sequence independent of a printing sequence to clean the sensitizing drum, and

when the printing device increases cleaning frequency in the safety mode compared to the standard mode, the printing device executes a cleaning process per printing job in the standard mode and executes a cleaning process per printing page in the safety mode.

34. (Previously Presented) A printing program described in claim 33 further causing a printing device to execute:

a product information reading step of reading product information for identifying a product of said printing device or said developing agent cartridge stored in a memory unit of said developing agent cartridge, wherein

said judgment step determines whether said developing agent cartridge is an authorized product or not by comparing the product information read by said product information reading step with a product information of an authorized product.

35. (Canceled)

36. (Original) A printing program described in claim 33 wherein

said developing agent cartridge is either a toner cartridge or an ink cartridge.

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37. (Canceled)